TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
NEC04P260		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/016513	08.11.2004	01.12.2003

International Patent Classification (IPC) or national classification and IPC

H04B7/06, H04B1 /707. H04B7/10, H04B7/26
H04J15/00

Applicant

NEC CORPORATION

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 5 sheets, as follows:

      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/016513

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-17 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-4,6-9 received by this Authority on 19.07.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets fig. 1-10 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, nos. 5,10

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/016513

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-4, 6-9	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-4, 6-9	NO
Industrial applicability (IA)	Claims	1-4, 6-9	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: JP 2001-203623 A (Oki Electric Industry Co., Ltd.), 27 July 2001 (Family: none)

Document 2: JP 2001-251233 A (Toshiba Corp.), 14 September 2001 & US 2001/0049295 A1

Document 3: JP 2003-110476 A (Matsushita Electric Industrial Co., Ltd.), 11 April 2003 & WO 2003/030404 A1 & EP 1353453 A1 & US 2004/058711 A & DE 060205582 D & CN 001488205 A

Document 4: JP 2002-135032 A (NEC Corp.), 10 May 2002 & EP 1202389 A1 & CN 1350348 A & US 6433738 B1

Document 5: JP 2003-283394 A (NEC Corp.), 03 October 2003 & WO 2003/081805 A1 & US 2005-0153657 A & EP 001492252 A1 & CN 001656711 A

Claims 1 and 6

Multi-beam transceivers that estimate the direction from which an incoming reception signal will arrive based on the predetermined delay profiles for each of a plurality of beams and then implement directional control in order to transmit the outgoing transmission signals in the estimated arrival direction of the incoming reception signal are well known, as disclosed in document 1

(paragraphs [0088] to [0108] and fig. 8) and document 2 (paragraphs [0072] to [0079] and fig. 5) for example.

Meanwhile, document 3 (paragraphs [0059] and [0060], and fig. 4 and 5) indicates that upon detecting a different delay profile with the same path timing as the path timing of the delay profile that was determined to have the maximum reception signal power, the reception antenna weights for the beams associated with the two delay profiles that were determined to have said path timing are subjected to proportional calculations in order to calculate a new antenna weight, which corresponds to a direction between the two beams that are associated with the two delay profiles in question.

In addition, it is apparent that the invention disclosed in document 3 also detects the reception signal power of each beam when detecting the path timing.

Furthermore, techniques for determining the direction of a user who is located in the vicinity of a point where two adjacent beams intersect based on the reception antenna weights and the reception signal powers of the two beams are well known, as disclosed in document 4 for example.

Such being the case, the invention disclosed in document 3 is considered to calculate a new antenna weight by subjecting the reception antenna weights and the reception signal powers of two beams to proportional calculations.

The method disclosed in document 3 is a method for inferring the direction from which signals will arrive based on the delay profiles for each of a plurality of beams, and thus it would have been easy for a person skilled in the art to conceive of configuring the

inventions set forth in claims 1 and 6 by applying the method in question as the method for inferring the direction from which signals will arrive in the well-known multi-beam transceivers that are disclosed in documents 1 and 2.

Claims 2 to 4 and 7 to 9

The multi-beam transceiver disclosed in document 1 receives the receptions signals by means of a rake reception (refer to paragraph [0062]), and said multi-beam transceiver is considered to be equipped with a delay unit for delaying the reception signals by a prescribed period based on the path timing that was established by means of the searcher.

As a result, document 1 is considered to disclose a technique wherein reception signals are used to generate a delay profile for each beam; the path timing is output in combination with the beam number of a beam that was determined to have said path timing; the reception signals are delayed by a prescribed period based on the aforementioned path timing; and the reception antenna weights that correspond to the aforementioned beam numbers are used to generate a new weight.

In addition, transceivers that employ multi-beam antennas wherein the reception signal power of the signals that were weighted by means of the reception beam former are measured in order to determine the transmission direction are well known, as disclosed in documents 4 and 5 for example.

Such being the case, it would have been easy for a person skilled in the art to conceive of configuring the inventions set forth in claims 2 to 4 and 7 to 9 in the

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

light of documents 1 to 5.